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FOREST SERVICE • UNITED STATES DEPARTMENT OF AGRICULTURE

CHALLENGE

IN WOOD RESEARCH

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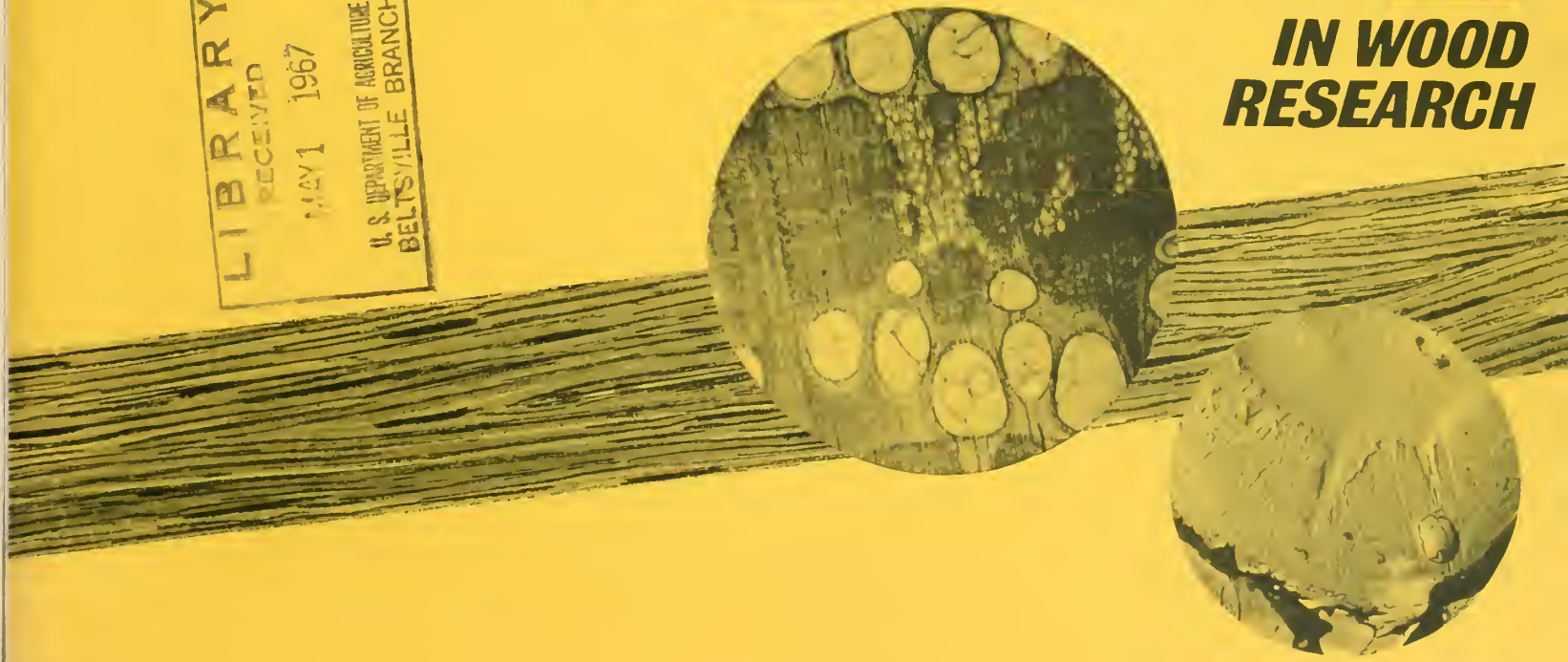

CHALLENGE
IN WOOD RESEARCH

Wood is one of the Nation's most valuable renewable natural resources. Already, with the benefit of research, wood provides us with thousands of useful and beautiful products which are continually being improved. It may surprise you that almost 6 percent of the U.S. gross national product and employment originates in the wood products industries. So the industries based on timber are about a third as large as the automobile industries. Today wood awaits only the magic of more research to exploit its almost unlimited potential in the modern world.

The Forest Service of the U.S. Department of Agriculture carries on an extensive research program aimed toward more productive and efficient use of wood. Career research scientists representing many disciplines carry on a diversified yet coordinated program of basic, applied, and developmental research in wood and wood-base materials. Scientists are encouraged to plan projects of their own choosing within the framework of the organization's mission. Cooperation with other research scientists throughout the world, with educators at nearby universities, and with technical representatives of wood-using industries is encouraged, as is publication of research results.

Research facilities, library services, technical resources, and fringe benefits in the Forest Service are unexcelled. An expanding program provides many opportunities for individuals to develop and advance rapidly to leading positions in a research team of worldwide reputation.

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National and Regional Wood Research

A National Institution for Wood Utilization Research

The Forest Products Laboratory, Madison, Wisconsin, is the world's largest wood utilization research institution of its type. Here research problems involving a large number of specialized, discipline-oriented project areas are attacked in depth. Basic and applied research is done on problems that have broad national implications. These involve the physical, chemical, anatomical, and engineering properties of wood as related to the development of wood products and processes and the engineering uses of wood.

Regional Forest Experiment Stations

Research to develop and synthesize knowledge from many specialized fields into practical applications—such as housing, new products development, more efficient processing methods, and entire wood conversion systems—is carried on by 8 regional Forest Experiment Stations at 15 locations in the U.S. Each Experiment Station works on regional problems as well as problems relating to an assigned mission in the national program. Each Station in effect acts as a field arm of the Forest Products Laboratory, focusing both national and regional studies on its region's wood utilization problems.

Positions in Wood Research

FOREST PRODUCTS TECHNOLOGISTS do research in the fields of timber quality, wood quality, wood anatomy, wood processing, and residue utilization. They may work with chemists, engineers, physicists, mathematicians, or geneticists. They make scientific studies aimed at enhancing the usefulness and value of wood, and developing or improving wood and wood-base products. The work of the forest products technologist spans the entire field of wood production, primary and secondary manufacture, and service in use.

CHEMICAL, CIVIL, ELECTRICAL, ELECTRONIC, and MECHANICAL ENGINEERS apply basic knowledge of wood to develop technical guides that will advance the effective use of woods (1) in wood and wood-base products, (2) as a chemical raw material, (3) for fiber products, and (4) in engineered structures. They develop efficient building systems for houses, using wood to the best advantage for a particular locality. They work also on the mechanism of pulping reactions, the function and design of experimental and pilot plant equipment, the evaluation of wood properties, development of new chemical processes, and development of new and improved solid wood and chemical processing equipment.

CHEMISTS work on the fundamental chemical structure of wood, the chemical aspects of wood-liquid relations, and on problems of lignin formation. They also apply basic knowledge of wood proper-

ties to the chemical conversion of wood into products such as pulp and paper, and to the recovery of cooking liquors in the pulping process to reduce water and stream pollution. They work also on chemical problems connected with the treatment of wood to prevent its destruction by fire, fungus, and insect attack.

PHYSICISTS carry on research that will provide an understanding of the responses of wood to physical stimuli, such as heat, light, force, electrical charge, and radiation. This understanding, in turn, is used to infer concepts of internal structure. Work is also done on wood-liquid relationships and nondestructive tests for wood.

MATHEMATICIANS develop experimental designs and standards of evaluation to solve problems of strength properties of wood. They also analyze data with electronic computers and determine the significance of factors and the relation between variables in the test results.

PATHOLOGISTS and ENTOMOLOGISTS study the natural resistance of wood to decay and insects as related to species, varietal differences, and age and location of wood in the tree, and find how such resistance may be improved. They also study the detection and control of fungal and insect-caused deterioration of wood and wood-base products.

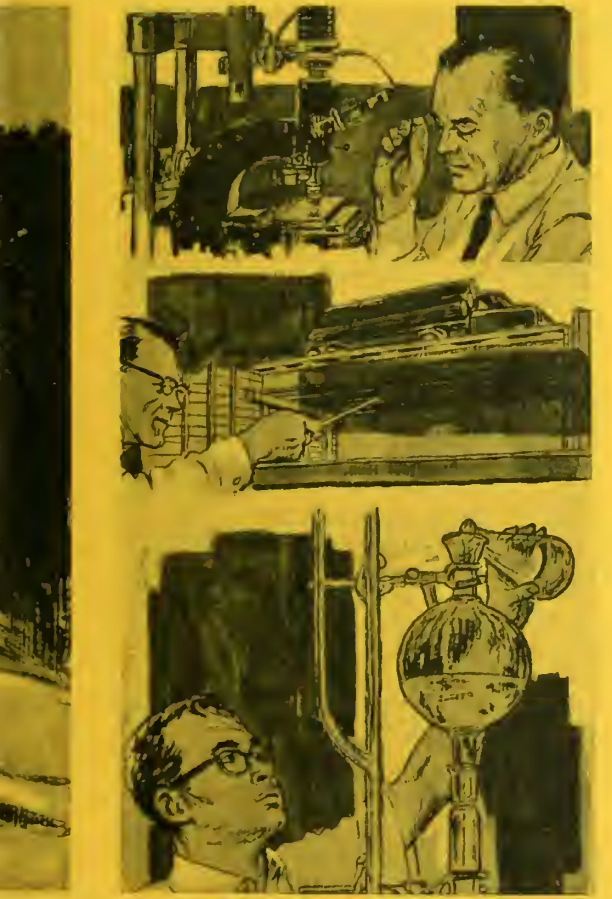
Fields of Specialization in Wood Research

Wood research programs offer a wide variety of careers in specialized scientific fields:

- Physical properties of wood including mechanical behavior, strength, heat, and electrical properties, density and moisture content, and physical behavior.
- Chemical properties of wood and wood components, chemical modification of wood.
- Chemical processing of wood including pulping, bleaching, fiberizing, forming, and chemical engineering.
- Solid wood processing including gluing, fastening, fabricating, sawing, veneering, machining, and seasoning. Also treatment of wood to prevent deterioration, improve properties, and impart fire resistance.
- Anatomical properties such as cellular composition and dimension, microscopic structure, and biological response and behavior.
- Engineering properties of wood related to machining, design of structures, and material processing principles.
- Industrial and mechanical engineering applied to wood-use problems using systems analysis, design considerations, and operations research.
- Wood growth and quality evaluation involving site and silvics, genetics, selection, and silvicultural treatment.
- New product development—lumber and dimension, plywood and laminations, pulp, paper and paperboard, roundwood, particle boards, chemicals, and furniture.

Creative Scientists Sought:

B.S.	IN	Wood science and technology
M.S.	IN	Organic chemistry, physical chemistry, and biochemistry
Ph. D.	IN	Physics
	IN	Chemical, civil, electrical, electronic and mechanical engineering
	IN	Mathematics, statistics
	IN	Biology, botany, pathology, and entomology



Career Benefits

Training opportunities: The Government Employees Training Act includes many flexible provisions that keep professional and technical staff abreast of rapidly changing developments.

The Training Act authorizes:

- Employee training at full pay within the agency or at outside facilities.
- Training at colleges, universities, professional institutes, industrial laboratories, or research foundations.
- Payment for all or part of tuition and related costs.
- Acceptance by employees of contributions and awards incident to training in non-Government facilities.
- Payment of travel expenses and registration fees for attendance at professional meetings.
- Cooperation among agencies to open up training courses across agency lines.

Promotions based on achievement: Forest Service policy is to promote from within the organization when fully qualified employees are available. Promotions are a major factor in building a sound organization and career program. Through wise and effective use of promotion opportunities, competent employees are motivated and rewarded. Capable persons are provided with satisfying careers and opportunity to attain full potential. The Forest Service career program requires that personnel be promoted on the basis of merit. Promotions are from among the best qualified career employees, without discrimination among them for any reason such as race, color, religion, national origin, sex, or politics.

Attractive salary rates: The Federal Pay Act provides for salaries comparable to private enterprise salary rates for the same levels of work. Salary rates can be increased for certain shortage category jobs in the engineering and scientific fields; wood science, of course, falls into this category.

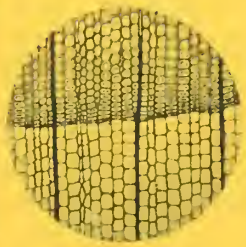
Also, the Federal Pay Act includes special features to stimulate high-quality performance such as:

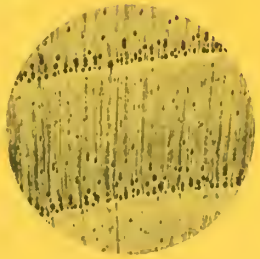
Recognizing the quality of performance. Extra within-grade increases may be awarded to individuals on the basis of high-quality performance.

Promotions. The salary increase provided by promotion is a little more than two within-grade increases.

Incentive and honor awards: The Forest Service encourages its employees to suggest better, simpler, or more economical ways of doing their jobs. It may give a cash award to an employee for a suggestion or invention that results in money savings or improved service. It may also reward outstanding job performance or other acts that are particularly meritorious and deserving of recognition.

Liberal vacation and sick leave benefits: Federal employees are entitled to annual leave for vacation and other purposes. The amount of leave depends





on the number of years (civilian and military) the employee has been in the Federal service. Leave is earned at the rate of 13 work days a year for the first 3 years, and 20 days a year for the next 12 years. After 15 years, 26 days of annual leave each year are earned. Sick leave is earned at the rate of 13 days a year. This leave can be used for serious illnesses and for appointments with doctors, dentists, or opticians. Sick leave is accumulative. It is one of the best forms of insurance an employee can have in case of extended periods of illness. New Year's Day, Washington's Birthday, Memorial Day, the Fourth of July, Labor Day, Veterans Day, Thanksgiving, and Christmas are holidays for Federal employees.

Low-cost life and health insurance: Federal employees may buy low-cost term life insurance without taking a physical examination. Two kinds of insurance are provided—life insurance and accidental death and dismemberment insurance. The amount of insurance will approximate your annual salary. The Government pays a portion of this and the employee pays 25 cents per $1,000 of insurance every 2 weeks through payroll deductions.

The Government sponsors a health insurance program for Federal employees. The program offers a variety of plans to meet individual needs, including basic coverage and major medical protection against costly illnesses. The Government contributes part of the cost of premiums and the employee pays the balance through payroll deductions.

Excellent retirement system: The Government has a liberal retirement system. Six and a half percent of a career or career-conditional employee's salary goes into a retirement fund. This 6½ percent comes out of the employee's paycheck and is withheld as his share of the cost of providing him or his survivors with an income after completion of his working career.

Retirement on an annuity is possible at age 55 with 30 years Government service. Typically in such a case the annuity may be about 55 percent of the average of the highest 5 consecutive years' pay. Retirement is also possible at age 60 with 20 years service. An employee who becomes disabled after at least 5 years of Government service may retire on an annuity regardless of his age.

Moving and travel expenses: For most shortage-category positions, traveling costs and cost for movement of household goods for the employee and his immediate family to the first duty station is paid by the Government. The payment is contingent on the employee's agreement to remain in the Federal Service for at least 12 months.

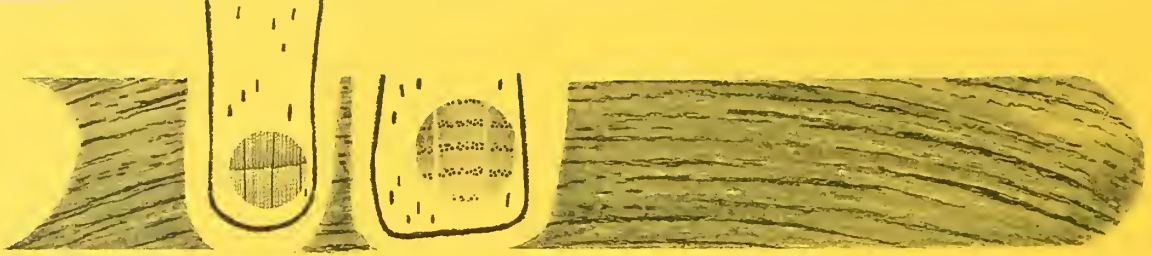
Attractive Career Ladder

Several salary entrance levels are available. Each level has a salary range that provides a yearly increase for the first 3 years and periodic increases thereafter. Career advancement is accomplished by promotions based on research potential and individual achievements. Starting and maximum salaries are shown in the table following.

Starting and Maximum Salaries for Various GS Grade Levels

(Pay Act of July 3, 1966)

Grade	Pasitians nat in shartage categary		Pasitions in shortage categary (farest products technologists, physicists, mathematicians, chemists, and engineers)—effective 2/12/67	
	Current starting salary	Current maximum salary	Current starting salary	Current maximum salary
GS–7	$ 6,451	$ 8,368	$ 7,729	$ 9,646
GS–9	7,696	10,045	9,001	11,350
GS–11	9,221	12,056	10,481	13,316
GS–12	10,927	14,338	11,306	14,717
GS–13	12,873	16,905	12,873	16,905
GS–14	15,106	19,813	15,106	19,813
GS–15	17,550	23,013	17,550	23,013



Grades	Requirements
GS–7	Bachelor's degree plus 1 year of appropriate graduate work or 1 year of research experience. Persons with a bachelor's degree may qualify for GS–7 if they have shown superior academic qualifications by their overall college average, by their average in their college major, by high class standing, or by election to national academic honor societies.
GS–9	Master's degree in appropriate field within the last 2 years and demonstrated superior ability in graduate studies; or bachelor's degree plus 2 years of appropriate graduate work, or 2 years of progressive research experience.
GS–11	Ph. D. degree; or 3 years of progressively responsible research experience beyond the bachelor's degree level.
GS–12	Ph. D. degree within the last 2 years, and demonstrated superior ability in graduate studies; or 3 years of progressively responsible research experience beyond the bachelor's degree level.
GS–13 GS–14 GS–15	Increasingly responsible professional experience is required at each higher grade level. These positions require experience showing ability to do the most difficult research, outstanding competence in a scientific field, and ability of a high order in planning, organizing, directing, and interpreting difficult research projects.

FOR MORE INFORMATION

Write to Chief, Bronch of Recruitment ond Quolifications, Division of Personnel Monagement, Forest Service, U.S. Deportment of Agriculture, Woshington, D.C. 20250, or contoct one of the following Forest Service Reseorch Heodquorters neorest you. Their oddresses ore:

Division of Forest Products and Engineering Reseorch, Forest Service, USDA, 12th ond Independence Ave., SW., Woshington, D.C. 20250

Forest Products Loborotory, Forest Service, USDA, North Wolnut St., Modison, Wis. 53705

Institute of Tropicol Forestry, Forest Service, USDA, P.O. Box 577, Rio Piedros, Puerto Rico 00928

Intermountoin Forest ond Ronge Experiment Stotion, Forest Service, USDA, 507 25th St., Ogden, Utoh 84401

North Centrol Forest Experiment Stotion, Forest Service, USDA, Folwell Ave., St. Poul, Minn. 55101

Northeostern Forest Experiment Stotion, Forest Service, USDA, 6816 Morket St., Upper Dorby, Po. 19082

Pocific Northwest Forest ond Ronge Experiment Station, Forest Service, USDA, 809 NE. Sixth Ave., P.O. Box 3141, Portlond, Ore. 97208

Pacific Southwest Forest ond Range Experiment Stotion, Forest Service, USDA, 1960 Addison St., P.O. Box 245, Berkeley, Colif. 94701

Rocky Mountoin Forest ond Ronge Experiment Stotion, Forest Service, USDA, 240 West Prospect St., Fort Collins, Colo. 80521

Southeostern Forest Experiment Stotion, Forest Service, USDA, P.O. Box 2570, Asheville, N.C. 28802

Southern Forest Experiment Stotion, Forest Service, USDA, T–10210 Federol Building, 701 Loyola Ave., New Orleons, Lo. 70113

AN EQUAL OPPORTUNITY EMPLOYER

The poper in this publicotion contoins o lorge omount of hordwood fibers. This poper represents o significont breokthrough in wood utilizotion research. Until recently no satisfoctory pulping method wos known for the use of hordwoods. But through cooperotive reseorch, the Forest Service ond privote industry hove developed o new process by which hordwoods con be used in popermoking.

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